LIBRARY
RECEIVED
JUL 28 1913
U. S. Department of Agriculture

Price One Shilling Net, or 25 Cents.

July, 1913

THE VETERINARY JOURNAL

A Monthly Review of Veterinary Science.

Editors for Great Britain and Ireland:—

FREDERICK HOBDAY, F.R.C.V.S., F.R.S.E.,
FORMERLY PROFESSOR IN THE ROYAL VETERINARY COLLEGE, LONDON.

GEO. H. WOOLDRIDGE, F.R.C.V.S., M.R.I.A.
PROFESSOR OF VETERINARY MEDICINE, PARASITOLOGY AND HYGIENE, IN THE ROYAL VETERINARY COLLEGE, LONDON.

Annual Subscription for the British Empire, 12s. Post Free; for the United States, $3.00.

LONDON.
BAILLIÈRE, TINDALL & COX,
8, HENRIETTA STREET, COVENT GARDEN.

AUSTRALIA AND NEW ZEALAND.
Messrs. GORDON & GOTCH, Ltd.,
Melbourne, Sydney, Wellington, &c.

NEW YORK:
W. R. JENKINS,
851 and 853, Sixth Avenue.

CHICAGO:
ALEXANDER EGER,
132, West Lake Street.

Entered as Second-Class Matter in the U.S. Post.

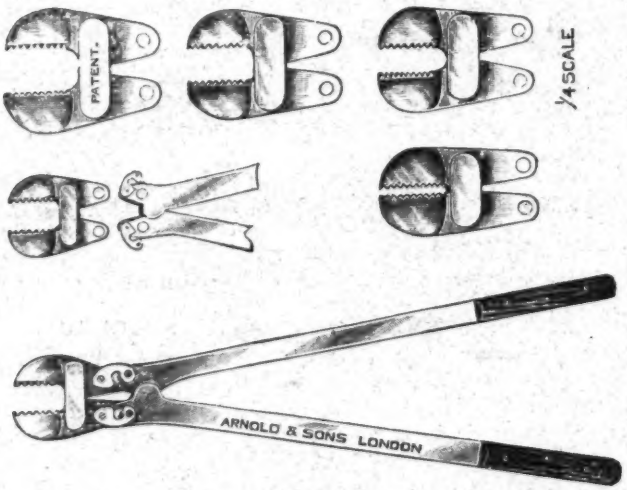
No. 457. Vol. 69.

"ARNOLD'S"

Patent Molar Tooth Cutter,

WITH REMOVABLE CUTTING BLADES
—— OF DIFFERENT WIDTHS. ——

The lightest, most powerful and reliable cutter ever brought before the notice of the profession.



PRICES.

With 1 Cutting Blade **£3 0 0**

Extra Blades, 17/6 each.

With 4 Cutting Blades of different widths ... **£5 12 6**

ARNOLD & SONS,

Veterinary Instrument Manufacturers,

GILTSPUR STREET, LONDON, E.C.

Telegraphic Address:
INSTRUMENTS, LONDON.

Telephone Number:
City 5240 (3 lines).

CONTENTS.

PAGE

EDITORIAL—
The Animal Anæsthetics Bill 299

GENERAL ARTICLES—
"Encephalic Embolic Strongylosis" or "Encranial Strongylgenic Embolism." By Professor JAMES LAW, F.R.C.V.S. 301
A Note on the Examination of Stallions for Government Certificates in New South Wales. By T. G. PALGRAVE, M.R.C.V.S. 308
Points in the Anatomy of the Fore Limb of the Llama as compared with Capra and Equus. By J. SHARE-JONES, M.Sc., F.R.C.V.S. 310

CLINICAL ARTICLES—
Congenital Defect of the Intestines in a Foal. By J. F. CRAIG, M.A., M.R.C.V.S. 321
Gastric Tympany in the Horse. By GUY SUTTON, F.R.C.V.S. 323
On the Prevalence of Bovine Sarcoptic Mange. By HENRY TAYLOR, F.R.C.V.S. 324
Two Avian Cases. By G. MAYALL, M.R.C.V.S. 325
Injury to the Mouth in the Horse through Whitewash. By G. MAYALL, M.R.C.V.S. 326
Chronic Nephritis in a Horse. By Dr. LORSCHEID 326

CANINE AND FELINE CLINICALS—
A Somewhat Uncommon Case in a Bitch Necessitating the Operation Ovaro-Hysterectomy. By J. PEDDIE, F.R.C.V.S. 328
Laryngitis in the Dog. By G. MAYALL, M.R.C.V.S.... 332
Two Unique Intestinal Cases in the Dog. By GUY SUTTON, F.R.C.V.S. ... 333
Renal Sarcoma and Prostatitis (Dog). By F. J. TAYLOR, M.R.C.V.S. ... 334
Intestinal Fistula in a Cat. By GUY SUTTON, F.R.C.V.S. 336

ABSTRACTS AND REPORTS—
Supervision of Milk Supply. By A. M. TROTTER, M.R.C.V.S. 337
Victoria Veterinary Benevolent Fund 342

REVIEWS 345
ROYAL COLLEGE OF VETERINARY SURGEONS 347
CORRESPONDENCE 348
LETTERS AND COMMUNICATIONS, &c. 348
BOOKS AND PERIODICALS, &c., RECEIVED 348

JAMES SWIFT & SON,

OPTICAL AND SCIENTIFIC INSTRUMENT MAKERS,

Contractors to all Scientific Departments of H.M. Government.

Grands Prix, Diplomas of Honour, and Gold Medals at London, Paris, Brussels, &c.

NEW MODEL "I.M.S." MICROSCOPE

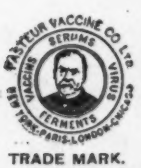
(As supplied to the Army Veterinary Department, War Office).

Specially designed for Bacteriology and Hæmatology.
With Improved Fine Adjustment and Mechanical Stage.

Fitted with $\frac{2}{3}$ in., $\frac{1}{6}$ in., and $\frac{1}{12}$ in. (Oil Immersion) Objectives, Oculars, Triple Dust-proof Nosepiece, Abbe Condenser, Iris Diaphragm, Special Mechanical Stage, &c., in Cabinet, **£23.**

New Catalogue (Just Published) gratis on application.

UNIVERSITY OPTICAL WORKS,
81, TOTTENHAM COURT ROAD, LONDON, W.



TRADE MARK.

SUPPLIED ONLY TO THE PROFESSION.

TUBERCULIN and MALLEIN.

In Hermetically-sealed Ampoules, containing about 4 cc., 9d. each.

Veterinary Tetanus Antitoxin	... ...	10 cc. 2/6; Dry form 3/-
Anti-Streptococcus Polyvalent Serum	...	10 cc. 2/6; Dry form 3/-
Canine Distemper	...	4 cc. 2/6

PASTEUR VACCINE CO.'S TUBERCULIN for Diagnosis of Tuberculosis,
PASTEUR VACCINE CO.'S MALLEIN for Diagnosis of Glanders,
ARE INSISTED UPON BY
Foreign and Colonial Governments importing BRITISH STOCK.

Over 300,000 doses successfully used in U.K.

"BLACKLEGINE."

CORD FORM OF BLACKLEG VACCINE.

Single, 10 doses, 6/-; 20, 10/-; 30, 15/-; 50, 24/-.

Double, 10 doses, 8/-. Needle Outfit, 2/6; Ditto with Forceps, 3/-.

Over 300,000 doses successfully used in U.K.

Over 300,000 doses have been sold in the United Kingdom. The Easiest Method of Inoculation, and always ready for use.
We also furnish Anthrax and Blackleg Vaccine (powder form); Rat Virus, White Scour Serum, &c.

Sole British Agents:—

C. H. HUISH & Co., 12, Red Lion Square, London, W.C.
Telephone—4639 Central. Telegrams—PROSUM, LONDON.

VERGOTININE

FOR

BROKEN WINDED HORSES

And BRONCHITIS GLANDON, PERSISTENT COUGH, CHRONIC CATARRH, &c.

PREPARED BY
A. VELPRY, Boulogne-on-Seine
FRANCE.

CURE GUARANTEED IN ONE MONTH

Price 6s.

USUAL DISCOUNT **30%** *TO VETERINARIANS.*

General Agents for Great Britain and Ireland:—

C. H. HUISH & Co., 12, Red Lion Square, London, W.C.

FOALING SEASON.

VACANCIES FOR AGENTS in unrepresented districts for the **Imperial Accident Insurance Co., Ltd.** Established 1878. Horses Insured against Death from Accident or Disease; Mares for Foaling and Loss of Foals; Hunters and Stallions Insured against Death or Disablement. Claims paid, £500,000. Address, AGENCY MANAGER, 17, Pall Mall East, London, S.W.

THE

VETERINARY JOURNAL

JULY, 1913.

Editorial.

THE ANIMAL ANÆSTHETICS BILL.

THERE is much more than appears on the surface in the subject of the *compulsory* use by law of certain anæsthetics for certain operations upon animals, and although we as a profession are unanimously in favour of the abolition of pain for animals, we have the practical side to consider, and in this the safety of our patients and our duty to the owner must each play a large part.

That anæsthetics should always be used where possible is universally agreed, but to reason for animals by analogy with man in this respect is not possible without the admission of certain variations, and it is in the selection of the anæsthetic that we as a profession must claim our right.

To be compelled to use chloroform for trephining the frontal sinuses in every case is an absurdity, for in many instances the operation is done painlessly with cocaine without even the restraining influence of a twitch, the animal being in the standing posture.

In the extraction of molar teeth, too, there is pain, but unfortunately there is often danger if a general anæsthetic is used, and in this discretion should be allowed.

These two operations have now been withdrawn from the First Schedule, but "line firing" has been substituted, and here, without some qualification as to the amount to be done, there is liability to danger. Thousands of horses are fired in the standing posture every year, some with cocaine and some without, but in hundreds of instances cocaine is all that is required and the patient will stand perfectly still. Besides which, to cast a lot of old horses (and it is upon old horses that firing is more practised than young ones) will mean a certain proportion of fractured spines, an accident avoidable if the horse is done standing. Cats and other small animals should certainly be included wherever "dog" is mentioned, as thousands of these animals are subjected to operation every year.

The Bill has passed its second reading and the promoters are, we happen to know, very anxious to behave with the greatest fairness to the members of the veterinary profession, but before it actually passes into the final stage there are certain very important points to be reconsidered, and to do this properly a committee of competent veterinary surgeons in actual practice ought to be asked to give their advice and opinion.

It will be too late when it becomes law to find out that it has numerous faults and that its provisions cannot be carried out without serious danger to the animals it is intended to benefit, and the practical side must be taken into consideration as well as the sentimental one.

It is necessary that the Parliamentary Committee of our Council should watch carefully what is being done in this respect.

General Articles.

"ENCEPHALIC EMBOLIC STRONGYLOSIS" OR "ENCRANIAL STRONGYLGENIC EMBOLISM."

Comments on Dr. Burton Rogers's paper in the June "VETERINARY JOURNAL."

BY PROFESSOR JAMES LAW, F.R.C.V.S.

IN his earlier work Dr. Rogers has shown a commendable disposition to investigate and advance veterinary medicine, and, when his judgment approved, to cut loose from earlier authorities, though they might have obtained a wide acceptance by the profession. Coming to us with such recommendation, and with the evidence that he had been a careful observer all through the late cerebrospinal equine epizootic in Kansas, his opinion should be treated with respect, and his facts carefully studied as tending to shed light on the affection.

The word Embolus.—It will be noted that he uses the word *embolus* in a sense different from the long accepted one. With him it is not "a clot or other plug brought by the blood current from another vessel, and now impacted into a smaller one so as to establish a complete obstruction." To him the embolus is still free in the vessel, and apparently need not become impacted in order to establish a right to the name. In these days of misapplication of foreign words to express thoughts distinct from their original meaning, and when there is being established a barbaric jargon, destitute of philological bases, it would seem commendable to avoid such vagaries and as far as possible maintain a purity and intelligibility of speech and expression.

The Hook-worm.—Familiar to Dujardin as the *Dochmius duodenalis*, and to Dubini as *Ankylostomum duodenale*, it was later known as *Uncinaria*, and finally as the *Hook-worm*. It is only an old acquaintance under a modern name.

Discredited Theories.—The writer (Dr. Rogers) has done well to call attention to the history of the Kansas outbreak as discrediting several of the claims set forth as to the causative factor.

(1) *The Microbian Theory.*—(*a*) In Europe and America alike the disease is habitually confined to a given area, but it differs from an *enzootic* in failing to appear year by year in the same locality even under the same conditions of soil, season, rainfall, &c.

(*b*) A microbe restricted enzootically, but multiplying in the invaded animal body, would presumably maintain its virulence, and continue to spread as long and as far as the favourable conditions extended. Even in Europe this was not the case with the disease in hand; while in Kansas, if the horses were kept indoors, or if brought from pasture, and if they did not speedily die after they were stabled, they escaped altogether. Its behaviour was like a case of poisoning rather than an infection.

(*c*) In Kansas the affection attended and followed a wet season, with an extraordinary production of cryptogams (moulds, rusts, mildews, smuts, fungi, bacteria, &c.), but its abrupt onset and equally sudden disappearance did not bespeak a poison of a very lasting kind. It broke out during the hot weather of July, and subsided in the end of September, when the cool Fall weather could hardly yet have set in. Liebener records its prevalence in Germany in summer and autumn when the higher temperature of the soil conduced to active organic growth, yet Hutyra and Marck quote outbreaks in the coldest season (January and February). Localities that suffered in one year might entirely escape the next, yet the disease might reappear after an interval of a few years, showing the existence of conditions favouring it in that district. In Kansas it showed all the characteristics—in sudden appearance and disappearance, in symptoms, and in subsidence when the food was changed—of the old-time poisoning by cryptogamic growths in wet, spoiled fodder. In New York cerebrospinal meningitis is recorded in horses by Large (1847) and Liautard (1869) in connection with fodder spoiled by cryptogamic growth, sparing those on sound fodder and showing some sporadic cases. In Pennsylvania later, Pearson, McCarthy, and Ravenel similarly traced its source to the cryptogams. In the early 'seventies, in the coal-mining region of Scranton and Wilkesbarre, I met with a most destructive outbreak in the pit mules fed on Canadian hay that had been drenched by heavy rains in transit, and that was surcharged with cryptogams. This was sharply circumscribed among the animals fed on the offensive hay, and was immediately put a stop to by change of fodder.

(*d*) In Europe the cerebrospinal affection, now known as *Borna's disease*, was traced in horses, asses, mules, cattle, sheep, calves, lambs, and dogs, while the recent Kansas outbreak was strictly confined to the equine race. This race restriction was

not due to the lack of exposure of animals of non-equine races, and suggests a difference in this outbreak from some, at least, of those of the Old World, and even from some recorded American instances in which animals of other races suffered as well. It indicates some variation as regards the essential causative factor, or of some hardly less essential accessory one. This would be quite in keeping with poisoning by cryptogams or saprophytic bacteria, with a different species in successive outbreaks or cases, and would discourage the theory of one specific bacterium as the advocates of the name *Borna's disease* maintain. It would favour, rather, the conclusion of a multiplicity of diseases due to as many different poisons, all of which operate on the nervous system so as to produce a general family resemblance.

(*e*) The advocates of one definite microbe in all cases of *Borna's disease* have failed to reach a common agreement as to the microbe itself. Siedamgrotzky found in the subarachnoid exudate a monococcus (exceptionally a diplococcus). Johné found a predominating diplococcus (free or endocellular) resembling the *Diplococcus intracellularis* of man. Ostertag found a streptococcus in chains of six to nine. Inoculation gave equivocal results. Provó found that his injections beneath the skin, into the nose, eyes or ear, or alimentary tract, failed, while intravenously it proved pathogenic (with exceptions) in the horse, and constantly pathogenic in goats and sheep. Cattle and swine proved refractory. Others had variable results; some a complex growth, as of *Diplococcus pneumoniæ* of Fränkel in company with the Borna diplococcus. How much was due to the latter, how much to complex infection, and how much to traumatic injury, is not always easy to decide. It may be that the different cocci found in the successful inoculations, each for itself, found an inviting way made for its entrance and colonization. It may be, on the other hand, that in the unsuccessful cases the subjects had already passed through a mild, unobserved attack, and had been thereby immunized.

This much may, however, be asserted, that the alleged germ, whatever its specificity under the conditions present, is practically dependent on those conditions, so that when these are changed the disease quickly subsides. It is therefore highly impolitic and unwarranted to class the affection among zymotic diseases or

plagues which spread continuously and remorselessly from every point where the microbe has secured an advantage. Our aim should be rather to eliminate the deadly predisposing conditions, without which the microbe is harmless. This was the substance of my answer to a friend who urged me strongly to visit Kansas and help them to arrest the calamity which was carrying off tens of thousands of horses, and which, they felt assured, would spread indefinitely. The outcome has fully justified my advice. It reminds me of another calamity which threatened the bovine race in Kansas, Illinois, and adjacent States in 1883. That was widely announced to be the *foot-and-mouth disease*. It had been so diagnosed by the State veterinarian, and by a veterinarian sent by the Canadian Government. From descriptions published I was convinced that it was *gangrenous ergotism*, and though then Chairman of the Treasury Cattle Commission, I decided that it would be needless to expend time and money on what could be effectually put a stop to by simple dietary precautions. But Kansas quarantined the affected herds, adjacent States quarantined against Kansas cattle, large commercial losses must necessarily follow, and the Assistant Secretary of the Treasury (Judge French) once more urged me to go as an imperative duty. I found the symptoms as I had expected—gangrene of the entire digit up to the coronet, to the fetlock, and in some cases almost to the hock, with similar gangrenous areas of the tips of the ears and of the tail. Very young calves taking milk only, sheep, swine, and horses living in the same muddy yards and ranging the same pastures were virtually unaffected. Horses only showed small gangrenous spots affecting the lips and buccal mucosa, but there were none of the pathognomonic vesicles on these, nor on any of the smaller ruminants, nor on pigs. The case was clear enough to me; but as the destructive lesions were of a terrible kind, well calculated to create a general panic, and as my diagnosis was contradicted by that of the two official veterinarians of Kansas and Canada respectively, I judged it best to make an experimental demonstration, and inoculated swine, sheep, and sucking calves from the active sores of the mature cattle, and waited two days for the result. That was, of course, negative in every case, so the State veterinarian conceded the justice of my position, the quarantine was raised, and simple dietetic precautions proved an effective prophylactic against new cases. Dr. D. E.

Salmon, Chief of the Bureau of Animal Industry, arrived on the last day of my experiment, and we together visited the herds known to be affected in Illinois, and found matters quite as bad as in Kansas, but here, as no quarantine had been imposed, it was sufficient to give the requisite advice as to diet. The two cases stand together as warnings against hasty and ill-founded diagnoses when large interests are involved.

The Parasitic Theory.—I am fully convinced that Dr. Rogers has been led by his enthusiasm to attach too much importance to the embolisms formed by the *S. armatus* (*Sclerostomum equinum*). These embolisms have been long known and appreciated as occurring in the mediastinal arteries and their branches, in the different arteries adjacent, in the posterior aorta, and even in the vessels of the brain, lungs, &c. We are familiar with the bowel and other fatal affections resulting. We are by no means forgetful of the stunted growth, emaciations, anæmias, rachitic, and other wasting affections of which they have been active promoters, if not the primary causes. But in all such cases of wholesale destruction of valuable studs by these parasites we have no observation nor record of instances in which the brain and spinal symptoms have so predominated as to put all others in the shade, and to cause the disease to be named from this one manifestation. And there appears to be good physiological reason why brain symptoms and lesions should be less constant and less in evidence than those of the abdominal and thoracic regions. The mesenteric vessels are the first to invite invasion by the parasite, and they present by far the most constant lesions. Having reached the abdominal aorta, the blood current favours instead of opposing the progress of the larval worm into other vessels back of the mesenteric vessels. Its progress forward is, however, increasingly opposed by the current growing stronger and stronger as we advance toward the heart. The more direct course, from the left ventrical into the posterior aorta, and the much greater volume of blood flowing into this vessel, tend powerfully to drive the parasites back into the posterior part of the body supplied by its branches, and to furnish a corresponding protection to the head, neck, fore-limbs, and anterior part of the chest supplied by the smaller anterior aorta. The fact that the parasite has been found in the brain or spinal cord or their different arteries does not settle the question. The question is: Is it so constant

in these situations as to account for a sudden and most fatal brain and spinal affection such as has never happened before in the history of its ravages? And if it was so in the Kansas ravaged area, why was it not so in adjacent counties that entirely escaped? Why did the supposed deadly parasitism confine its ravages to the months of August and September, when within the animal body the worm is nearly equally active all the year round? Why did the supposed parasitic embolism subside entirely in horses closely stabled? Why did hard-working horses kept indoors entirely escape? Experience shows that indoor feeding is no protection against the worm which is now under consideration. Too often the ova and embryos wash into wells and water supplies, so that the constantly stabled horse is kept continually in a state of intense parasitism. Yet he rarely suffers from a fatal cerebrospinal affection. Young horses are the most favourite and severely beleaguered victims of the parasite. I have seen large studs literally destroyed by this worm, but I have not seen a general complicating nervous affection. To attribute the Kansas equine mortality to the attacks of this worm without another effective concurrent cause is to oppose the trend of anatomical and physiological facts, the evidence of the most common habitats of the parasite, and the general experience of veterinarians. Not one nor ten cases of verminous embolism of the brain, spine, or membranes, though actually demonstrated by careful dissection, can materially shake this position and render it even probable that the 20,000 or 30,000 deaths of horses in a limited area in Kansas were simply through embolisms of the nervous systems caused by the worms.

Worms as a possible Accessory Cause.—The question is pertinent: Is there no other way in which the parasites may be conceived to contribute to a fatal poisoning? Among the most deadly poisons are proteids from the animal or vegetable kingdom, unchanged by digestion or by passing through the alimentary or other mucosa. These operate mainly by enormously increasing the susceptibility to the same poison introduced after a moderate length of time. G. Wells shows that one millionth part of a gramme of crystallized white of egg sensitizes a guinea-pig, so that a second dose of the same administered after an interval is fatal. The endotoxins of cryptogams and bacteria are proteids, and doubtless many of them when injected, without

passing through an animal membrane and undergoing change, can act in this deadly way. Place beside this the fact that the *Sclerostomum equinum*, like other blood-sucking parasites, leaves a raw surface wherever it has bitten, and we can easily conceive how a horse sensitized by the entrance of the toxic proteid through an early series of bites, and not immunized in the interval, may be fatally poisoned through a new dose of the same poison similarly introduced through a later series of bites. This has not been proved to exist in the Kansas disease; but as we have been dealing with theories, as yet unproved, it seems permissible to introduce another, one with a not unreasonable, scientific basis, and which has not yet been put out of court by the stern logic of facts. It must be conceded that a long experience without such a happening is unfavourable to its acceptance. We would require to assume that a source (probably cryptogamic) of one of the most deadly poisons has not hitherto synchronized with an infestment by this blood-sucking parasite so as to produce a panic among horsemen. And it may well be asked if the proteid poison was only produced in that small area and for that short time, how did surrounding parts escape? Assuredly many other places harbour the parasite in Kansas and elsewhere. Again, how did the poison so quickly lose its toxic power when the disease subsided? It is making a heavy demand upon our faith to ask us to accept a reason for the extreme limitation of such a supposed cause. But the disease itself was confessedly limited as to area, and no good and sufficient explanation has yet been furnished, apart from the presence of cryptogams and bacteria. If this will serve to instigate inquiries that will throw more light on the subject it will not have been suggested in vain. If disproved, it will at least have to a certain extent cleared the field and narrowed down future inquiry to a more promising margin.

Value of Vermicides.—In "Question 32" the question is rather defiantly put if the thousands of doses of vermicides given were not a main factor in reducing the deaths? The objector might well retort: What of the blatant claims of the battalion of secret nostrum vendors who invaded, and still infest, devastated Kansas? No one of these will allow that any case, not already beyond hope, ever died after taking his panacea. Treatment, antidotal, eliminating, antiseptic, and parasiticide, if well directed, is always good, but with an affection so universal and so quickly

fatal therapeutics is seldom to be thought of or hopefully undertaken. Prophylaxis must be the sheet anchor in our trouble. Vermicides may destroy the mature worms in the *primæ viæ*, and lessen the number of *future infection atria*, but this cannot at once close the still unhealed bites, nor hinder the instant introduction of a lethal dose if the poison is still introduced in food or water. Much less can the removal of the mature worms make an end of the immature specimens already entrenched in the vessels, and which still wait their opportunity to produce embolic domiciles to the deadly injury of their host. Anthelmintics are not to be ignored nor forgotten; but when the attack is already on they are but a forlorn hope. Their true field of usefulness is before the attack; and still more important is it to eliminate the poison (cryptogamic, vegetable narcotic, &c.), which is presumably the primary cause of the disorder.

JAMES LAW.

A NOTE ON THE EXAMINATION OF STALLIONS FOR GOVERNMENT CERTIFICATES IN NEW SOUTH WALES.

BY T. G. PALGRAVE, M.R.C.V.S.
Auckland, N.Z.

OF the need for the examination of stallions there can be no doubt, but it is open to serious question whether the method of examination as carried out in New South Wales will be of any great use in effecting a general improvement in the horses of that State.

The regulations governing the examination only provide for stallion owners *voluntarily* submitting their stallions for examination, and the only penalty for non-possession of the Government certificate is that the animal cannot receive a prize at any show subsidized by the Government. There is nothing whatever to prevent a stallion owner continuing to use as a sire a stallion that has not been submitted for examination, or has been *rejected as unfit* for the Government certificate; and there is no official objection to his travelling such a stallion and taking as many mares as he can get; neither is he debarred from exhibiting such a stallion at any show as long as he does not receive a prize. Any horse owner of experience can imagine for himself the plausible excuses the owner of such a stallion would have ready to account

for the non-possession of a Government certificate for his stallion when he (the owner) is trying to book mares.

Apart from this, any horseman knows that there are plenty of stallion owners who (for a variety of reasons) never exhibit their horses at shows, and consequently the non-possession of a Government certificate is of little or no consequence to them; and though many of these stallions might pass the examination there are undoubtedly plenty which would not.

The stallions which are shown are generally "the pick of the basket"; and it will therefore be seen that the examination in very many cases does not reach the kind of stallion at which it is aimed.

To make examination of all stallions compulsory, and to render impotent those which failed to pass the examination, might be considered a very drastic step; but the same end might be reached by imposing a tax on all uncertificated stallions three years old or over, and the tax might be made heavy enough to tax the majority out of existence as sires.

The hereditary unsoundness for which a stallion is refused the Government certificate are:—

(1) Roaring.
(2) Ring-bone.
(3) Side-bone.
(4) Bone spavin.
(5) Bog spavin.
(6) Curb.
(7) Thorough-pin and bursal enlargements.
(8) Chorea.
(9) Osteoporosis.

Whether bog spavin or thorough-pin and bursal enlargements (except in so far that the two first are often found in conjunction with badly formed hocks) are sufficiently serious to warrant the rejection of a stallion suitable otherwise as a sire, is a matter of opinion. Why cataract, navicular disease, and bad feet have not been included in the schedule it is hard to understand. Many authorities consider that the predisposition to cataract and navicular disease can be inherited, and bad feet will render any horse comparatively useless.

The regulations provide for the rejection of any stallion not up to standard as regards type and conformation, but they do not

make any mention as to what standard is required, and thereby give scope for much argument and difference of opinion. If by "type" it is meant that the stallion submitted must be true to type of his breed, all cross-breds or grades would be debarred from receiving certificates; if the stallion is not expected to be true to type, in what particulars and to what extent may he differ from it? "Standard" can only mean a fixed standard accepted by the majority of horse-breeders as a correct one, but there is none such laid down in the regulations, nor is any standard that may be in use elsewhere specified. Had the regulations provided that any stallion, though sound, might be refused a certificate if he were, for certain clearly defined reasons, considered unsuitable as a sire, the matter would have been greatly simplified.

It would also be to advantage if the breeding of a stallion were taken into account when a Government certificate is granted. As matters stand, a draught stallion (for example) receives a Government certificate, and that certificate is the same no matter whether the stallion receiving it is a pure-bred Clydesdale, Shire, Suffolk Punch, or Percheron, or whether he is a cross-bred or grade.

The certificates issued in some parts of the United States of America appear to me to be managed on better lines, as they state "pure-bred stallion," "cross-bred stallion," "grade stallion."

POINTS IN THE ANATOMY OF THE FORE LIMB OF THE LLAMA AS COMPARED WITH CAPRA AND EQUUS.

By J. SHARE-JONES, M.Sc., F.R.C.V.S.

University of Liverpool, School of Zoology.

Any information concerning this species cannot fail to prove of interest to the comparative anatomist. A beast of burden used extensively as a "pack" animal in the wild and mountainous districts of South America, where the other more common domesticated animals would be of little if any use, a knowledge of its structure will doubtless be of some value to the veterinary surgeon.

Works on natural history usually include an account of the

distribution and natural habits of the animal. Flower and Lydekker state that "The word llama, sometimes spelt lama, is the name by which the Peruvians designated one of a small group of closely allied animals, which, before the Spanish conquest of America, were the only domesticated hoofed animals of the country, being kept, not only for their value as beasts of burden, but also for their flesh, hides, and wool—in fact, supplying in the domestic economy of the people the place of the horse, the ox, and the sheep of the Old World."*

Referring to the wild animal, Dr. Cunningham says that "It is not easy to describe its general appearance, which combines some of the characters of a camel, a deer, and a goat. The body, deep at the breast, but very small at the loins, is covered with long, soft, very fine hair, which on the upper parts is of a kind of fawn colour, and beneath varies from a pale yellow to the most beautiful snow-white. The head is provided with large ears, in general carried well back, and is covered with short greyish hair, which is the darkest on the forehead. Occasionally the face is nearly black. As a rule it lives in flocks of from half a dozen to several hundreds, but solitary individuals are now and again to be met with. They are very difficult to approach sufficiently near to admit of an easy shot, as they are extremely wary, but on being disturbed canter off at a pace which soon puts a safe distance between them and the sportsman, even though he should be mounted. Despite their timidity, however, they are possessed of great curiosity, and will sometimes advance within a comparatively short distance of an unknown object, at which they will gaze fixedly till they take alarm, when they effect a speedy retreat. Their cry is very peculiar, being something between the belling of a deer and the neigh of a horse. It would be difficult to overestimate their numbers upon the Patagonian plains, for in whatever direction we walked we always came upon numbers of portions of their skeletons and detached bones."

The earliest account of this animal is that by Agustin de Zarate, Treasurer-General of Peru in 1544. Referring to it as a sheep, he states that "In places where there is no snow the natives want water, and to supply this they fill the skins of sheep with water and make other living sheep carry them; for, it must be remarked, these sheep of Peru are large enough to serve as

* Flower and Lydekker: "Mammals Living and Extinct," p. 299.

beasts of burden. They can carry about one hundred pounds or more, and the Spaniards used to ride them, and they would go four or five leagues a day. When they are weary they lie down upon the ground; and as there are no means of making them get up, either by beating or assisting them, the load must of necessity be taken off. When there is a man on one of them, if the beast is tired and urged to go on, he turns his head and discharges his saliva, which has an unpleasant odour, into the rider's face. These animals are of great use and profit to their masters, for their wool is very good and fine, particularly that of the species called Pacas, which have very long fleeces; and the expense of their food is trifling, as a handful of maize suffices them, and they can go four or five days without water. Their flesh is as good as that of the fat sheep of Castile. There are now public shambles for the sale of their flesh in all parts of Peru, which was not the case when the Spaniards came first, for when one Indian killed a sheep his neighbours came and took what they wanted, and then another killed a sheep in his turn."

"The disagreeable habit here noticed of spitting in the face of persons whose presence is obnoxious is common to all the group, as may be daily witnessed in specimens in confinement in the menageries of Europe. One of the principal labours to which the llamas were subjected at the time of the Spanish conquest was that of bringing down ore from the mines in the mountains. Gregory de Bolivar estimated that in his day as many as three hundred thousand were employed in the transport of the produce of the mines of Potosi alone."*

Beddard states that: "A variety of names, Lama, Alpaca, Huanaco, Vicuna, have been applied to these animals; but it appears that the names are in excess of the number of the species. Mr. Thomas, who has lately inquired into the matter, will only allow two, the Huanaco (*Lama huanacos*), of which there are two domestic races, the Llama and the Alpaca, and the Vicuna (*Llama vicugna*). They are both South American in range. . . . The first llama ever seen in Europe was brought in the year 1558 to the town of Middleburg in Holland; it was purchased and presented to the Emperor of Germany. Gesner gives a curious figure of it, representing the animal as a comparatively colossal

* Flower and Lydekker: "Mammals Living and Extinct," p. 303.

beast submitting itself to the guidance of a dwarfish man. The habit of 'spitting' of the lama is well known."*

But so far as the writer has been able to ascertain, after a careful search through the archives of the Library of Natural History in the University of Liverpool and from inquiries made to comparative anatomists, no publication has hitherto been issued concerning the anatomical structure of the animal.

From observations taken on the spot by W. Hope Nelson, Esq., who has an intimate knowledge of the beast and employs a large number on his estates in South America, the writer gathers that the llama is very docile, yet extremely agile, whilst its powers of endurance are extraordinary. From the delicate external appearance presented by the limbs and the nature of the country (without prepared roads) over which the animal is worked, one would naturally expect that sprained flexor tendons, exostoses on the limb bones, &c., which are such troublesome affections in Equus, would be frequently encountered. They are, however, practically unknown, a peculiar fact which led the writer to examine the deeper structures of the limb, an examination which brought to light the following points, many of which, it will be observed, have a direct and interesting bearing upon the immunity of the species from such affections as those mentioned above. Throughout a comparison is frequently instituted with Equus as the best known domesticated type, and Capra a more familiar somewhat closely allied species.

After the removal of the skin from the region of the shoulder it was found that the *scapular fascia* formed a very tough and dense layer, much more dense than in Equus, and more even than in Capra. In the manner of its arrangement, and the way in which it held the subjacent muscles in position, it resembled that in most other species. Anteriorly, however, it became much more thickened out and spread over the front of the shoulder-joint, binding down firmly the tendon of origin of the biceps muscle and entirely obscuring it from view.

The fascia of the arm was likewise thick, and was continuous inferiorly with that of the forearm. Attached to the summit and back of the olecranon process superiorly this latter formed a powerful binding sheath around the muscles at the back of this

* F. E. Beddard: "Mammalia," p. 286.

region (flexors of metacarpus and digit). It was firmly attached on either side to the lateral edges of the radius, and was so dense that no trace of the lines of division between the superficial portions of these muscles could be made out before the fascia was removed. In most other animals these lines are plainly visible.

At the knee the layer which corresponded with the annular band or ligament had a remarkable arrangement. It consisted of a number of sets of fibres which ran in different directions. They interlaced freely and in such manner that a complete tube was formed around the joint (fig. iv). Owing to the peculiar arrangement of the fibres, this tube, whilst affording a very high degree of protection to the underlying structures of the part, played the *rôle* of a kind of elastic bandage, and permitted flexion and extension of the joint with unusual freedom.

On the inner aspect of the knee the fibrous carpal arch was peculiar, inasmuch as it was formed by two definite and distinct layers. On making an incision into the superficial layer, it was found to cover the small metacarpal artery with its accompanying vein. An incision into the deeper layer revealed the synovial membrane of the carpal sheath, so that this layer corresponded with the fibrous arch which completes the tube here for the passage of the tendons of the superficial and deep flexor muscles of the digit in Equus and other species.

Below the knee it was found that the removal of the skin did not reveal the tendons of these flexors at any part of their course between the knee and fetlock. An incision made in the deep fascia covering the tendon is represented in fig. ii, 13. The cut edge of the fascia has been hooked back to reveal the tendons, and from the figure the thickness of the fascia is apparent.

Upon further dissection the fascia was found to be firmly attached on either side to the metacarpal bone and to pass round the posterior surface of the tendon of the flexor perforatus. It thus completed a long tube for the passage of the tendons of the digital flexors. Inferiorly it blended with the back of the tendon of the superficial flexor, where the latter expanded to form the tubes at the back of the metacarpo-phalangeal joints for the passage of the tendons of the deep flexor. At the front of the joint mentioned it blended with the anterior common ligament.

The *flexor tendons were thus encased in a powerful tube*

throughout their course down the metacarpal region, and thus not only were the tendons, together with the vessels and nerves which followed their course, adequately protected from external injuries, but the thick fibrous covering would act as *a natural supporting bandage*, which, whilst permitting perfect freedom of action, would give increased strength and power of endurance to the limb.

Superficial Anatomy.

Outer Aspect.—The tubercle of the spine of the scapula could be located before the removal of the scapular fascia, as could also the spine itself, as it extended upwards and downwards from the tubercle. The outer aspect of the humerus was particularly well clothed by muscle. Extending downwards from the external tuberosity at the upper extremity the deltoid ridge could be detected, but it was not so prominent as in Equus, neither was the deltoid tubercle, since both ridge and tubercle were concealed by the continuation of the scapular fascia. The latter, after spreading out over the shoulder, obtained a firm attachment to both the tubercle and ridge.

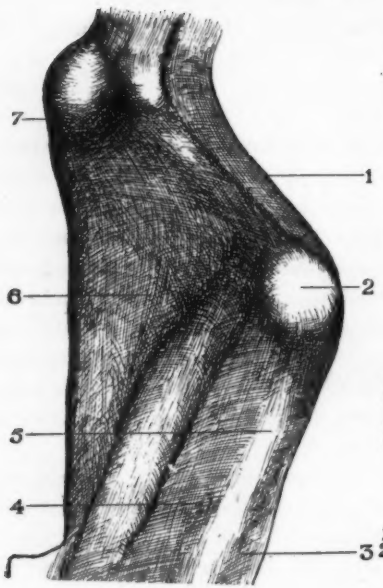
Descending this aspect of the limb we next reach the olecranon process of the ulna (fig. i), which is very prominent and relatively massive.

In the forearm (fig. ii) the outer aspect of the radius is found to be well clothed by muscles, the extensors and flexors of the metacarpus and digits being here grouped around the bone in such manner that only a very small portion of the bone, namely, that between the extensor metacarpi magnus tendon (fig. ii, 6) and that of the extensor of the digits (fig. ii, 14) lies subcutaneously.

The outer aspect of the metacarpal bone is visible almost in its entirety (fig. ii, 16), since the tendon of the lateral extensor of the digit or extensor suffraginis (fig. ii, 3) blends with that of the anterior extensor of the digits (fig. ii, 14) within a very short distance of the carpus.

The layer of dense fascia referred to, and the numerous tendons, completely conceal the first phalanx.

Of the *ligaments*, only the outer division of the great suspensory is visible on this aspect. It appears on the side of the fetlock joint as it passes to join the extensor tendon.



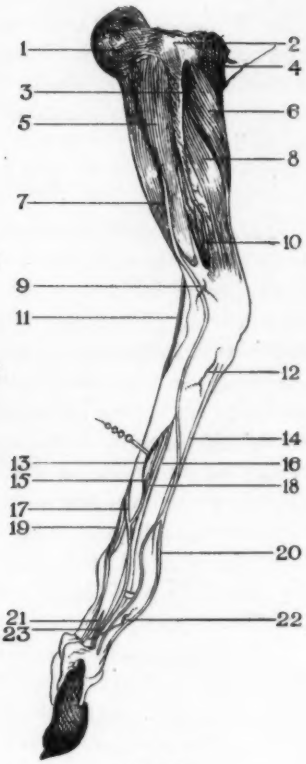


FIG. I. FIG. II.

OUTER ASPECT OF SHOULDER AND ARM. SCAPULAR FASCIA EXPOSED.

1, Biceps muscle; 2, position of shoulder joint; 3, supraspinatus muscle; 4, infraspinatus muscle; 5, spine of scapula; 6, large head of triceps extensor cubiti; 7, summit of olecranon process of ulna.

RIGHT FORE LIMB. OUTER ASPECT (*continued*).

1, Summit of olecranon process; 2, outer condyle of humerus; 3, lateral extensor; 4, anterior portion of belly of extensor metacarpi magnus; 5, flexor metacarpi externus; 6, posterior portion of belly of extensor metacarpi magnus; 7, superficial division of ulnar nerve; 8, belly of anterior extensor of digits; 9 and 12, superficial arteries referred to in notes; 10, portion of deep flexor of digits; 11, branch of posterior radial artery; 13, dense fibrous layer hooked back to display flexor tendons, &c.; 14, tendon on anterior extensor of digits; 15, tendon of deep flexor of digits; 16, metacarpal bone; 17, branch of communication from internal plantar nerve; 18, external plantar nerve; 19, common digital artery; 20, dorsal nerve from ulnar (digital); 21, tendon of deep flexor of digits; 22, branches of external digital artery (perpendicular artery of pastern); 23, other (external) tendons of deep flexor.

MUSCLES AND TENDONS.

Fig. i represents the muscles on the outer aspect of the region of the shoulder and arm covered by the deep fascia.

Supraspinatus (fig. i).—This is an extremely narrow muscle, narrower than in Capra, and much more so than in Equus. Its size corresponds to the small infraspinous fossa in the scapula.

Infraspinatus (fig. i).—This muscle, on the other hand, is very large for the size of the animal. In outline it is somewhat triangular, since it broadens out gradually as the vertebral border of the scapula is approached.

The Deltoid (fig. i).—As in most other animals, this muscle possesses a false septum which appears to divide it into two portions. This division is more complete than in Capra or Equus, and it cuts off a small portion near the inferior extremity of the muscle. This portion conceals about 2 in. of the inferior end of the infraspinatus. Moreover, it has a different insertion from the remainder of the muscle, since it is attached to the ridge just above the tubercle.

Caput Magnum (fig. i, 6).—A relatively smaller portion of this muscle is represented on this aspect. This is due to the greater size of the caput medium.

Caput Medium (fig. i).—A very much larger muscle than in Equus. It extends upwards beneath the deltoid, and spreads out anteriorly over the lateral surface of the humerus, so that it completely covers the structures in the musculo-spiral groove. Both these heads assist in forming inferiorly the powerful tendon of insertion which is attached to the summit of the olecranon process (fig. i).

Extensor Metacarpi Magnus (fig. ii, 4 and 6).—This muscle is very large, and its muscular portion is somewhat peculiar. It apparently arises in two portions, one of which, the larger, has a broad flat origin from the ridge of bone which constitutes the anterior lip of the musculo-spiral groove. The fibres of this portion have a spiral arrangement. The posterior portion takes origin from the outer condyle (fig. ii, 6) of the humerus in common with the anterior extensor of the digits. The fibres of this portion run obliquely downwards and inwards, and pass beneath those of the anterior division. The two sets of fibres become blended and are succeeded by a common tendon, which

for the size of the animal is very powerful. The tendon passes over the front of the knee and has the usual insertion.

The division of this muscle into two portions is a point of interest. There is no trace of such division in the muscle itself in Equus, notwithstanding the fact that it arises from the ridge referred to and the condyle. There is, however, an imperfect division in Capra.

The conformation of the muscle differs considerably from that of most other animals, and the arrangement of the fibres is such that in the living animal there is present a depression in the place of the usual well-marked and rounded elevation here found. At first sight this would appear to indicate a relative muscular weakness in this part of the limb. It will be gathered from what has been said above, however, that actually the reverse is the case, and the limb is even stronger so far as the power of extending the carpal joint is concerned.

Extensor Pedis or Anterior Extensor of Digits (fig. ii, 8).—Arises from the outer condyle of the humerus in common with the posterior division of the preceding muscle. The latter overlaps its origin, and the anterior extensor first makes its appearance superficially about 2 in. below the level of the elbow articulation.

Its muscular belly differs in shape from that of most other animals, and is simply a thin strip lying alongside the posterior division of the metacarpal extensor.

Its tendon does not begin until a point about 2 in. above the carpus is reached. It is comparatively thin, and plays over the carpus to the outer side of that of the preceding muscle, passing first over the few fibres which represent the extensor metacarpi obliquus.

Below the carpus it is joined by the tendon of the lateral extensor (extensor suffraginis) and above the metacarpophalangeal joint; the common tendon thus formed splits into two portions, which are inserted into the terminal phalanges of the digits.

It is interesting to note that the division of the tendon of this muscle can be readily observed immediately the tendon appears from beneath the annular band of the knee, so that the lateral extensor is a reinforcement, not of the extensors of both digits, but rather of that of the external digit only.

Lateral Extensor (fig. ii, 3).—This muscle corresponds with

the extensor suffraginis of Equus. In this species it has several interesting features. It arises, as in other animals, from the outer condyle of the humerus, and it has a considerable muscular belly. This is apparent on the surface of the limb throughout its extent after the skin has been removed, appearing between the extensor pedis and the external flexor of the metacarpus.

Midway down the radius it is followed by a powerful tendon, which lies posteriorly on a portion of the deep flexor of the digit.

After passing over the lateral aspect of the carpus beneath the annular ligament the tendon inclines forwards, and at the junction of the upper and middle thirds of the metacarpus it joins the outer portion of the tendon of the anterior extensor of the digits.

The greater bulk and power of the muscle are notable features.

Flexor Metacarpi Externus (fig. ii, 5).—Relatively of large size. A branch of the ulnar nerve (fig. ii, 7) makes its appearance between the tendon of this muscle and that of the flexor metacarpi medius. It calls for no other remark.

Extensor Metacarpi Obliquus.—This muscle calls for special notice on account of its being so poorly developed. Its muscular portion consists of simply a few very delicate fibres. A fibrous band arises from the outer aspect of the inferior third of the radius in front of the tendon of the lateral extensor. It passes beneath the tendon of the anterior extensor of the digits and then obliquely downwards and inwards over the tendon of the extensor metacarpi magnus to its insertion into the metacarpal bone.

This muscle is so extremely rudimentary that it cannot exert any appreciable action on the extension of the knee.

Flexor Perforans or Deep Flexor of the Digits.—A small portion of this muscle is seen on this aspect of the limb between the tendons of the lateral extensor and flexor metacarpi externus (fig. ii, 10). This is most unusual since in most animals the muscular portion is here clothed and entirely concealed by the bellies of the flexors of the metacarpus.

The Arteries.

No vessels are represented in fig. i.

In fig. ii a number of superficial vessels are represented in the region of the knee.

A branch from the posterior radial artery passes outwards beneath the tendon of the flexor metacarpi externus, pierces the fibrous covering of the knee and appears superficially beneath the skin (fig. ii, 9). It splits into two branches which descend one on either side of the branch of the ulnar nerve to be described hereafter (fig. ii, 7).

Fig. ii, 12 represents a vessel which corresponds to the external dorsal interosseous artery. It pierces the fibrous layer from within outwards and splits into two divisions, one of which ascends superficially on the antero-external aspect of the knee. The other division descends and terminates in the skin about 2 in. below the knee on the outer side of the metacarpal region.

Above the fetlock a number of small branches appear from beneath the outer division of the suspensory ligament and are distributed over the lateral aspect of the joint superficially.

Below the metacarpo-phalangeal joint others appear which correspond with those of the perpendicular artery of the pastern.

The above two sets of vessels, together with the vessels of the foot, will be dealt with later.

The Nerves.

Ulnar.—Passing backwards and outwards from the inner aspect of the olecranon process this nerve runs down the fore-arm on the deep face of the ulnar portion of the flexor metacarpi medius.

On reaching the inferior third of the fore-arm it gives off a large branch which passes outwards between the tendon of the flexor metacarpi externus and that of the middle flexor (fig. ii, 7).

This branch passes superficially over the outer aspect of the knee and then runs for a short distance on the surface of the fibrous covering of the tendons of the flexors of the digit. It next runs obliquely downwards and forwards on the surface of the metacarpal bone and inclining towards the front of the limb passes downwards on the surface of the outer portion of the tendon of the anterior extensor of the digits.

Just above the metacarpo-phalangeal joint it divides into two portions and these continue their course downwards and form the dorsal nerves of the digits (fig. ii, 20).

External Plantar (fig. ii, 18).—This is the continuation of the other division of the ulnar. This division passes through the

carpal sheath with the flexor tendons and runs down the metacarpal region on the outer edge of the tendon of the deep flexor of the digits. For the greater part of its course it is thus covered by the fibrous arch which also covers the tendons. Just above the metacarpo-phalangeal joint it appears superficially and is joined by a branch of communication from the internal plantar nerve (fig. ii, 17).

It runs superficially over the outer aspect of the metacarpo-phalangeal joint and is continued as the external collateral nerve of the outer digit.

This latter nerve divides at the fetlock into two portions, the larger of which follows the course taken by the artery which is distributed to this surface of the digit. The smaller, which might be said to correspond to the middle digital nerve in Equus, passes forwards and is distributed on the antero-external aspect of the terminal portion of the digit.

(*To be continued.*)

Clinical Articles.

CONGENITAL DEFECT OF THE INTESTINES IN A FOAL.

By J. F. CRAIG, M.A., M.R.C.V.S.
Professor in the Royal Veterinary College of Ireland, Dublin.

Congenital imperfections of the alimentary canal are not uncommonly noted in the domestic animals. The chief malformation observed in the intestines is imperforate anus. In the following case the anus was quite normal in formation and the want of continuity occurred at the point at which the large colon joined the small colon. This abnormality was only recognized at a *post-mortem* examination and was unexpected, the condition being apparently quite unique. The subject was a thoroughbred filly foal, born on May 5 last. The foal was normal in appearance. On the second day it was observed to be constipated and no meconium was passed. Laxatives and enemata were given to it without result. It became very dull and weak and was inclined to turn in circles. Towards the end

it vomited some of the drench given to it. It died on the third day.

The foal was sent to the College for *post-mortem* examination. This was made about twenty-four hours after death.

The mucous membranes were slightly yellow, the abdomen not markedly tympanitic. On opening the abdomen slight blood extravasations were noticed under the peritoneum at the

A, Cæcum; B, Large colon; C, Blind posterior end of large colon; D, Blind anterior extremity of small colon; E, Rectum; F, Anus.

umbilicus over the umbilical vessels, a normal condition. There was a small quantity of blood-stained fluid in the peritoneum. The small intestines were distended with gas, the vessels over them slightly congested. The large colon was represented by a single column of bowel arranged in the normal position, bent on itself behind the xiphoid cartilage of the sternum. The blind extremity was directed backwards towards the pelvis. This piece of bowel corresponded with the first and second portions of

the double colon. The third and fourth portions were absent. The bowel was 2 ft. long, puckered and provided with four longitudinal bands near the cæcum, two of which gradually disappeared. The only opening in connection with it communicated with the cæcum. The blind extremity corresponded with the pelvic flexure of the normal large colon. With the cæcum it was occupied by meconium, which amounted to 3 lb. by weight. The small colon was 3 ft. long, attached by the small mesentery, as in the normal animal, but it ended in front in a rounded blind extremity at the roof of the abdomen on the left side behind the point at which the duodenum is continuous with the remainder of the small intestines. There was no continuity, either apparent or real, between the small and large colon. The small colon was continuous behind with the rectum, which was normal and about 6 in. long. The stomach was filled with a dirty coloured fluid, mixed with globules of oil and pieces of vegetable fibre, but no milk. The lungs along their lower borders were solid.

The accompanying photograph, which was kindly taken by Mr. Geo. Haines, Registrar, R.C.V.I., shows on the right side the cæcum and the abnormal colon, and on the left side the rectum and small colon with its blind extremity.

GASTRIC TYMPANY IN THE HORSE.

By GUY SUTTON, F.R.C.V.S.

Kensington, W.

Recent advertisements of probangs for the horse came to my mind early this month, when urgently called to a horse, which was rightly described by the owner as, "looking as if he have burst." On the previous night, the animal, a cob gelding, had got to the corn-bin and had eaten a considerable quantity of oats. On the following morning he was watered. Within a short time there was a good deal of discomfort. Two colic drinks were given without effect. Mustard had been rubbed on the belly, and the usual colic formula gone through. When I saw him, about eighteen hours after the disastrous meal, he showed every appearance of a horse that had just ruptured, or was about to rupture, the stomach. Cold sweats, an abdominal expression, and frequent, but unsuccessful attempts at vomiting.

The abdomen was enormously distended with gas. Luckily I had with me a horse catheter, and determined to see if this would give mechanical relief. Withdrawing the stilette, I passed the tube up the nostril through the œsophagus, and, as the animal was comparatively small, it reached the stomach. The result was magical. Spray was shot from the mouth of the catheter for at least a yard, and the gas escaped with a hissing noise for many moments. The horse instantly became relieved and his girth much reduced. As a preventive of further fermentation I poured down the catheter about 1 oz. of oil of turpentine mixed with 3 oz. of linseed oil. No further treatment was required, and I went home feeling that I had been of some use.

ON THE PREVALENCE OF BOVINE SARCOPTIC MANGE.

By HENRY TAYLOR, F.R.C.V.S.
Hayward's Heath.

In The Veterinary Journal for June, 1913, occurs an article on the above by Mr. A. W. Noel Pillers, in which he remarks that the text-books dealing with parasites seem to all comment on its rarity.

It may therefore be opportune at this juncture to add to the list of references as given at the end of the article by Mr. Pillers, three others of which I am cognizant. Possibly there are others.

As far as I am aware the first person in this country to report the occurrence of sarcoptic mange of the ox was W. R. Davis. He met with the disease at a dairy farm near Edinburgh, and published an account of it in The Veterinary Journal for February, 1896. Some doubts were expressed at the time as to the correct classification of the parasite, but it was referred to a Continental authority, who confirmed the opinion about it being a sarcopt.

Next comes a record by Thackeray in the *Journal of Comparative Pathology* for 1899 or 1900. He met with an outbreak in England, but from the wording of the article he was evidently unaware of the previous notice by Davis.

Lastly, I reported having met with some cases in Edinburgh, in The Veterinary Journal for March, 1902. Since then I have

once more come across the disease. This occurred in two cows brought from a distance into the market here, and to the best of my knowledge a note was inserted in the *Veterinary Record* some six years ago.

Altogether it seems as though this kind of mange is not so rare as the text-books would have us believe. Perhaps now we may hope to have its rarity qualified.

TWO AVIAN CASES.

By G. MAYALL, M.R.C.V.S.

Bolton.

I.—Dilatation and Paralysis of the Crop (Crop Bound).

A white Leghorn hen, brought to me on June 7, had a large swelling at the crop. This was hard, painless, and dilating the crop to its full extent. The bird sat in a dejected and listless attitude, appetite was absent. The crop (previously freed from feathers at the site of the incision) was incised, and its contents, about the size of a cricket ball, consisting of hard wheat grains, and impacted fibrous grass were removed. The edges of the wound in the crop and skin were washed with dilute chinosol and all blood swabbed away.

The walls of the crop were sutured with interrupted sutures of sterilized silk, and the skin with an uninterrupted suture of the same material. Brown bread crumbled up fine and milk were given the first day or two, afterwards plenty of water, and the bird kept on soft food for several days. Recovery was uninterrupted.

II.—Dislocation of the Phalanges in the Fowl.

A Buff Orpington, brought to me on April 4, had a complete dislocation of the first and second phalanx of the third digit. I shaped a piece of gutta percha (previously soaked in hot water), to the joint and when dry and having reduced the luxation, bandaged the digit firmly with a thin plastic bandage (Willows and Co.). It remained in position for about a month and the joint regained its normal appearance and state. The movements of the fowl during the time were limited by keeping it up in a fowl house with a dry and lightly littered floor.

INJURY TO THE MOUTH IN THE HORSE THROUGH WHITEWASH.

By G. MAYALL, M.R.C.V.S.
Bolton.

A LORRYMAN put a bucketful of whitewash on the back of his lorry to convey to a place two miles away. A horse fastened to the back of the wagon licked up the whitewash which was upset from the bucket by the movements of the lorry.

On examination of the animal, the tongue, frænum linguæ and the lips were excoriated, saliva was dribbling from the mouth, and the whole buccal cavity was too sore for the horse to take any food. An electuary of powdered liquorice root, glycerine of belladonna, and boracic acid was prescribed and milk given to drink. Next day the horse was better but vigorously resented any examination of the mouth. On the third day he ate some sloppy food and drank cold water. After the sixth day he had apparently completely recovered. Lime as whitewash is not at all an uncommon producer of mishaps, but I find little in the literature of toxicology and therapeutics regarding accidents from it. Cats and dogs have come under my notice that have been more or less seriously injured by it, and I recorded a case or two of this description in the VETERINARY JOURNAL for 1911, p. 421.

CHRONIC NEPHRITIS IN A HORSE.

By Dr. LORSCHEID.
Clinique of the Veterinary College, Hanover.

CHRONIC nephritis belongs to the not very frequent ailments of horses; its diagnosis is not quite easy, since the clinical methods of examination in veterinary medicine have not yet reached the same point of perfection as in human medicine. The ensuing case is therefore specially noteworthy, since the horse concerned remained a long time in the clinique. Repeated examinations could be undertaken, and finally diagnosis was confirmed by *post-mortem* on the horse in the Pathological Institute of the College.

The horse was left with the history that for a long time it had eaten badly. By questioning, it was ascertained that frequently it only drank half a bucketful of water, and at other times two to three bucketfuls; also the secretion of urine varied in

amount. The animal was a light brown gelding, 7 to 8 years old. The owner stated that the horse came from England, and was used as a racehorse.

The horse had a weak, dull expression, and was in bad condition. The coat was lustreless and staring. The conjunctival mucosa was red and moist. There were œdematous swellings under the chest, on the sheath and extremities. The pulse was 36 to the minute, very strong, uniform, and regular. The heart sounds were remarkably loud. The heart beat thumping and visible externally at the chest-wall. The heart sounds were clear; the field of percussion extended. Nothing abnormal was noticed with the breathing. Food was taken badly, and the horse drank about half a bucketful of water daily.

Examination of urine showed that it was at times coloured yellow, at other times yellowish red. The specific weight varied between 1,035 and 1,045. The reaction was frequently acid. The consistence was muco-thready. The urine was clear. The albuminous contents varied during the time of observation between 0·04 to 0·1 per cent. In microscopic preparations numerous kidney epithelial cells and also granulated cylinders, as well as a few epithelial cylinders, could be demonstrated. About 1 to 1·5 litres per day of urine was evacuated. The horse showed no pain on urinating, but on rectal examination pressure over the left kidney caused it to groan. The surface of this kidney was smooth. With the object of testing kidney function dyes (indigo, carmine, and methylene blue) were subcutaneously injected, in order to note the activity of the kidneys by their passage out in the urine. The colouring stuff was excreted in quite small amounts, and at first excreted much slower than in the case of normal kidneys. After the injection of phloridzin no grape sugar was noticed in the urine, which is always the case in healthy horses.

Diagnosis.—Hypertrophied heart, chronic nephritis.

Since hypertrophy of the heart in nephritis generally arises after six to eight weeks (Strümpel, "Text-book of Special Pathology and Therapy"), so the chronicity and previous history was confirmed.

In the subsequent fourteen days the horse showed the previously described symptoms. The treatment consisted in doses of tannoform and grape leaves. As heart remedies caffeine and

digitalis were given. Dieting was also observed. No improvement could be effected in the condition of the horse; it became weaker and more listless. Gradually signs of uræmia developed after fourteen days' residence in the clinique. The horse showed great somnolence and stupor, and now and then attacks of giddiness. The breathing was laboured. The appetite quite disappeared, diarrhœa set in, and the dung was tinged with blood and bad smelling.

After five days of these symptoms the horse died.

The autopsy revealed pronounced hypertrophy of the left ventricle, chronic parenchymatous nephritis, and severe inflammation of the mucosa of the colon.

The inflamed mucosa was probably due to the products of decomposition of the urine being eliminated through the intestinal mucous membrane, and causing inflammation. (Hutyra and Marek, vol. i, p. 983, English Trans.).—*Deutsche tierarzt. Woch.*

Canine and Feline Clinicals.

A SOMEWHAT UNCOMMON CASE IN A BITCH NECESSITATING THE OPERATION OVARO-HYSTERECTOMY.

By J. PEDDIE, F.R.C.V.S.
Dundee.

The following case occurred in my practice two years ago. On Tuesday, May 30, 1911, I was requested to see a bull bitch which was not making progress with whelping. The history of the case is as follows: The owner of the bitch, when she noticed the animal in heat, sent her to the gamekeeper in charge of her brother's kennels in order that she might be properly cared for. Unfortunately, a large retriever dog managed to jump the barrier protecting the bitch, and lined her before being discovered. The bitch began whelping on the Sunday morning previous to my visit and continued during the following day, five pups being taken away by the gamekeeper, also part of another pup, which he informed me seemed to be a very large one.

On palpating the abdomen I could detect one large pup in a horn of the uterus, but could feel nothing on examination *per vaginam*. The bitch, as might be expected, was by this time weak and considerably exhausted.

After thinking over the case thoroughly, I came to the conclusion that the only chance of saving the life of the bitch was to have an operation carried out without delay. To this my client readily consented, as the animal was a very special favourite. I administered a dose of brandy, washed up the whole of the abdomen and perineum carefully with ether soap, and dried with cotton-wool, retaining a covering of this in position with bandages, and had the bitch brought to my hospital for treatment.

As the kennels where the bitch was examined were situated

Photograph showing the Rupture and the two Fœtuses.

sixteen miles away, it was four hours later before the operation about to be described was carried out. The bitch was placed on the operating table in the dorsal position, the cotton-wool covering the abdomen removed, and the skin freely swabbed with iodine solution. After anæsthesia had been induced, a free incision was made through the abdominal walls and peritoneum in order to fully expose the uterus.

The accompanying photograph shows very beautifully the appearances presented, which were of quite an unusual and

interesting character. The walls of the uterus were very thin, especially the right horn, which was ruptured in two places; from the largest of these one half of the complete puppy was protruding into the abdominal cavity. The puppy, a portion of which had been removed by the gamekeeper, had come as a breech presentation, and after the hinder parts had been torn away it had evidently receded, and was found in the same horn of the uterus immediately posterior to the rupture. The pups were of great size; I regret I did not have them weighed. It was at this stage clearly evident that an ovaro-hysterectomy had to be carried out. Sterile swabs were placed round the uterus to prevent further infection of the peritoneum, and the pups were removed. Catgut ligatures were then tied above the ovaries, and they were excised with their uterine attachment intact. A

Photograph showing the size of the Rupture in the Uterus.

silk ligature double was passed through the fundus of the uterus and each half ligatured, the peritoneal covering being then drawn over the stump with catgut sutures after it had been previously lightly touched with lysol. The peritoneum was sutured with interrupted sutures of catgut, then the muscular walls, and finally the skin with silkworm gut sutures. Unfortunately, I had no sterile drainage tubes at hand, and had to substitute (by fixing in position between two sutures) a folded piece of silkworm gut. Sterile swabs were then placed over the wound, covered by a

layer of double cyanide gauze and absorbent wool, the whole kept in position by a properly adjusted abdominal girth.

The narrowed tail-piece is made of just sufficient length to reach backward to the anterior edge of the inferior extremity of the vulva, the attached tapes passing up the perineum by the side of the tail, where they are fixed to the most posterior of the cross tapes on the abdominal portion of the bandage. The double tape in front is passed between the fore-legs to the point of the chest, knotted there, and the ends carried up on either side of the neck, knotted again, and finally passed back to be fixed to the most anterior of the cross tapes. A thick folded piece of cotton-wool is laid along the spine to prevent injury where the tapes cross. By this method it is very easy (in a bitch) to retain abdominal dressings in perfect position. Ten ounces of a warm saline solution with half an ounce of brandy was injected into the rectum, and repeated very early the following morning. As there was no serious rise in temperature the dressings were retained in position until the third day, when they were found to be soaked with discharges. The wound and surrounding skin was cleaned up with warm lysol solution, and two drainage tubes inserted, one of glass, 10 millimetres diameter, and the other rubber. The bitch was given one and a half drachms of nuclein solution three times daily, and kept on liquid nourishing diet—milk, fish, soup, beef-tea, well-boiled tripe minced, &c.

On the ninth day a small hernia of omentum was observed protruding through the glass tube, and two days later it had assumed large proportions. The bitch was rechloroformed, the omentum returned, and the tube taken out, a work of some little difficulty owing to the manner in which the omentum had become fixed through the openings in the tube. The peritoneum was closed and the abdominal wall sutured, the wound being left with the single rubber drainage tube. The dressings were continued daily, the discharge gradually ceasing. The remaining tube was taken out on June 19, and the bitch discharged from hospital on June 28 with the operation wound healed, although still wearing a supporting bandage.

My object in recording this case is twofold. First, to place on record a somewhat unusual and rather interesting uterine lesion associated with pregnancy; and in the second place to illustrate the enormous recuperative power of the peritoneum

when infected, as it must have been in this case, through the uterine rupture, and not to describe an operation the technique of which, I am aware, is well known to veterinary surgeons, especially those engaged in canine work.

I am of opinion that the atrophy of the uterine wall was brought about by pressure consequent upon the enormous development of the mongrel puppies contained in the uterus. For the purpose of securing the accompanying photographs the uterus with pups were suspended in a large glass bath containing a solution of formalin, and photographed with an inverted camera.

LARYNGITIS IN THE DOG.

By G. MAYALL, M.R.C.V.S.
Bolton.

An Aberdeen terrier "Jock," brought in on April 29, was slavering from the mouth and in a lean condition. There was no cough but the dog had not eaten properly for several weeks and was listless and disconsolate ; there was fœtid breath.

Being a snappy, vicious animal to deal with, ½ gr. of morphine sulphate was injected hypodermically. Half an hour afterwards the mouth was opened widely by means of tapes in the top and bottom jaws, the tongue was depressed and the probang passed. There was no obstruction in the gullet, but on examining the pharynx a piece of abraded mucous membrane, necrotic in its depths, as large as a two-shilling-piece, could be seen at the back of the last molar tooth of the right side of the lower jaw. The excoriated surface extended on to the pharynx. It was swabbed with 10 per cent. hydrogen peroxide solution, curetted and afterwards dressed with boric acid. This treatment was continued for a few days and subsequently an electuary of powdered liquorice and glycerine was given daily. Under this treatment the dog improved sufficiently to lap a little milk and cold water and eat a few pieces of raw meat. He went home in about a fortnight when apparently recovering, and a solution of acid hydrochlor. dil. was prescribed and taken for him, and instructions as to diet given. He lived for about a month and was then found dead in his abode.

Post-mortem revealed septic infection of the pharynx and larynx gradually healing, septic pneumonia and endocarditis with an *ante-*

mortem clot of blood as large as a filbert nut in the right auricle. The original injury of the throat appeared to be due to a wound of the mucosa by a foreign body followed by septic laryngitis. Evidently some of the septic material passed down the wind-pipe on to the lungs and into the blood-stream. A noticeable feature of the case was that the dog never coughed.

TWO UNIQUE INTESTINAL CASES IN THE DOG.

By GUY SUTTON, F.R.C.V.S.

Kensington, W.

Are there many authentic cases of the perforating duodenum ulcer in the dog? Recently one has occurred in this practice. The dog, a fox terrier, had suffered from persistent diarrhœa for about two months, and had been treated by a layman with varying success. When I first saw him he was fairly lively, but thin, had a fair appetite, and a temperature of 102½°, and no regular history of vomiting. Tuberculosis immediately came to my mind. He was tested with tuberculin, but the only result, and I must say it has been the usual one in my experience, was that, following an injection of 1 c.c. of tuberculin, as ordinarily supplied, the temperature fell 2°. The diarrhœa, with fæces consisting frequently of bloody mucus, continued in spite of all treatment. Mr. Cousens, M.R.C.V.S., met me in consultation, and from him I obtained the valuable suggestion that tuberculin of human origin applied to the conjunctiva gave a far more reliable result with canines when injected. This was carried out with negative results. The dog now got rapidly worse, and occasionally vomited. Appetite failed, and emaciation was extreme. The amount of blood passed in the fæces increased, and the owner's consent was obtained to destroy it. The *post-mortem* examination revealed a perforating duodenal ulcer about the size of a green pea. There was remarkable thickening of the wall.

The specimen was unique in my experience, and Mr. F. J. Taylor, M.R.C.V.S., kindly showed it at the Central Veterinary Meeting. I am told that none of the members present could recall an entirely similar case. In further conversation with the owner, Mr. Taylor learnt that discomfort had been a feature about two hours after food.

At the same meeting Mr. Taylor showed a portion of a large intestine from a bloodhound. The hound was brought by the owner with

the complaint that he was losing flesh, and that his breathing became laboured on the slightest exertion. Appetite was capricious, but on the whole good, and there was occasional diarrhœa. The temperature was raised one degree. Examination of the chest with a phonendoscope gave no positive indication of disease, and nothing was revealed by manipulating the abdomen. Certainly there was no indication of pain.

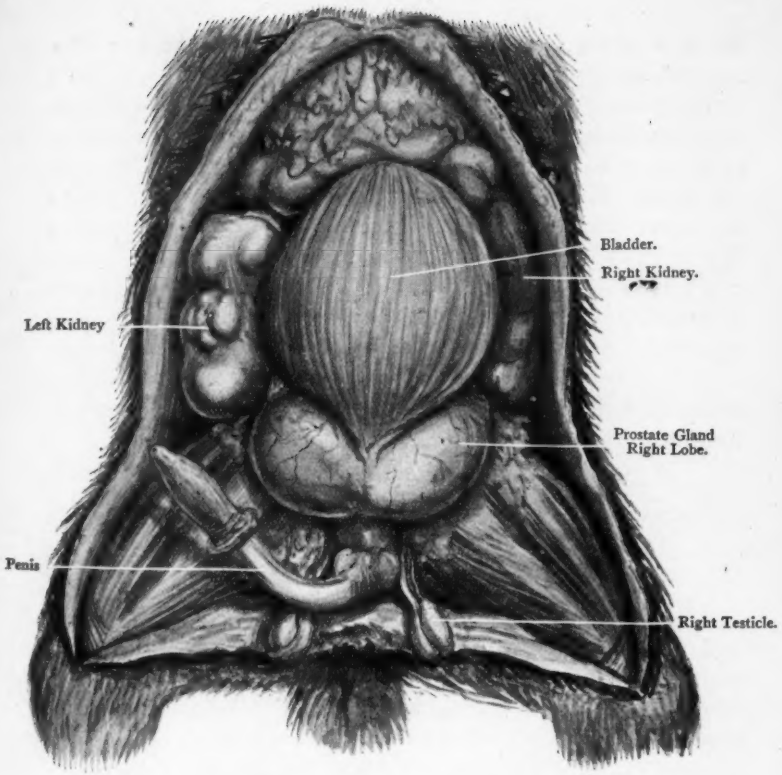
Treatment continued for about six weeks, the patient steadily getting worse, but as is usual in prolonged illness there were intervals of temporary improvement. Towards the end of the illness the hound occasionally vomited immediately after a meal, but in a few hours would usually eat again with relish. He was tested with tuberculin with similar results to the terrier in a fall of temperature. The conjunctival test was negative. He died suddenly after an attack of vomiting. The *post-mortem* examination showed a "dilatation" of the large intestine. On opening this "tumour," an abscess cavity with a capacity of about 5 oz. was revealed. It contained about 1 oz. of thin yellow pus. The normal intestine appeared to be continuous with the wall of the abscess, but I cannot believe that injecta had ever passed through this cavity, but that an abscess had formed between the coats of the intestinal wall and that the division between the lumen of the bowel and abscess cavity had ruptured, shortly prior to death. I am indebted to Mr. Taylor for making a *post-mortem* examination of these cases.

RENAL SARCOMA AND PROSTATITIS (DOG).

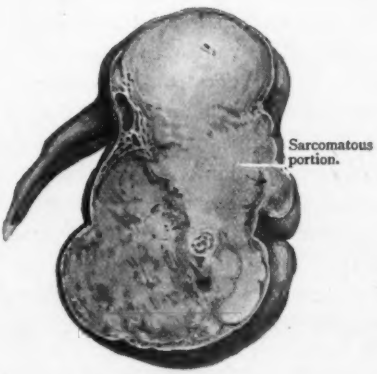
By F. J. TAYLOR, M.R.C.V.S.

London.

Subject.—An aged Aberdeen terrier, very infirm and showing marked inability to use his hind limbs was admitted with a history of frequent micturition, sometimes of a difficult drippy nature, and urine occasionally stained with blood. Constipation, of a most obstinate character, was treated unsuccessfully by the owner; arching of the lumbar region of the spine was noticeable, with evidence of acute pain on pressure. The enlarged prostate could be detected by external flank pressure between the tips of the fingers, and on rectal examination the enlarged and hardened prostate gland could be readily felt close behind and surrounding



Condition found *Post Mortem.*



Section of Left Kidney.

the neck of the bladder, each lobe being almost the size of a bantam's egg.

Treatment.—Warm oily enemas were introduced into rectum every four hours, and catheterization was carried out with difficulty owing to the thickening of the urethra and smallness of the lumen. Iodides were administered without success, and as the owner would not entertain the idea of castration, painless destruction was carried out with morphia and chloroform.

Post-mortem revealed a new growth of glandular tissue surrounded by dense hard muscular tissue, and the left kidney was half sarcomatous, the other half being spurious kidney structure; the right kidney appeared to be hypertrophied but macroscopically normal in structure; the bladder was chronically thickened from cystitis.

INTESTINAL FISTULA IN A CAT.

By GUY SUTTON, F.R.C.V.S.

Kensington, W.

I was recently asked to see a male Persian cat with a small swelling in the region of the umbilicus. Whilst examining it, the thin wall ruptured, and about a teaspoonful of yellow pus trickled away. The owner, rather disgusted, suggested that it should come into hospital. On examining the wound more closely, I determined to enlarge the orifice. To my surprise, at the bottom of the cavity appeared a tuft of hair massed together. On seizing this with the forceps a "hairball," about 2 in. long, shaped like a cigar, came from a sinus, which appeared to run through, or between the layers of the abdominal wall. I was afraid to investigate too deeply, though it was evident that there was still *hair* left in the sinus. The portion removed is identical in appearance with a "hairball" frequently found in *post-mortem* examination on Persian cats. The general health of the cat is perfect, but I see no way to account for this "find" beyond the supposition that the mass had ulcerated its way through from the intestine.

The case is three weeks old to-day, and shows no indication of offering a *post-mortem* examination. Is this case unique?

Abstracts and Reports.

SUPERVISION OF MILK SUPPLY.*

By A. M. TROTTER, M.R.C.V.S.

Glasgow.

It is a curious but noteworthy fact that the legislation of this country is so framed that only the milk of those cows affected with such diseases as are scheduled under the Diseases of Animals Act or tuberculosis of the udder can be ordered to be destroyed as unfit for the food of man. This is a grave defect, as the cow is subject to many other diseases which render her milk a dangerous food for human consumption.

The apathy of the authorities in this all important matter is beyond conception. It is our proud boast that in no other country in the world is human life held in such high regard, but a very superficial inquiry will suffice to show that the reverse is the case, as in no other country is the slaughter of the innocents permitted with so much *sang-froid*. It cannot be successfully maintained that the authorities are not aware of the existence of this discreditable condition of affairs, which amounts to a national scandal. Time and again has the imperative necessity of promoting and maintaining a pure milk supply been brought under the notice of the powers that be, but always with the same negative result. Meanwhile the insidious seeds of disease are being spread broadcast over the whole population, causing untold misery and suffering.

A brutal murder is committed in our immediate vicinity and all is excitement. The papers are scanned for the latest information. The perpetrator of the dastardly deed is denounced on every hand; but is the murderer one whit worse than the dispenser of death-dealing microbes in our milk supply? The first is invariably brought to justice, but the second is permitted by law to go scot free and to add insult to injury by charging the full market value for his vile mixture, as if it were a pure, wholesome food. By the law of humanity both ought to be brought to justice, as both are guilty of a crime against mankind. In many instances the cowkeeper is aware that one or other of his cows is diseased, but greed and a callous indifference to the sufferings of his fellows prevents him from destroying the milk drawn from the affected member of his herd.

Diseases other than Tuberculosis.—One of the most common pathological conditions to which cows are subject is inflammation of the udder, technically known as mastitis. The milk drawn from cows thus affected must be regarded as highly dangerous when used for food. The injurious properties of such milk cannot be too strongly emphasized and many instances can be quoted where it has caused illness to the consumer. Professor Holst, of Christiania, observed acute catarrh of the stomach and bowels in four adults and four

* From the Annual Report of the Veterinary Surgeon to the Corporation of the City of Glasgow.

children who resided in three different houses. On inquiry he found that all had partaken of milk some hours previous to the attack. The herd from which the milk had been obtained was examined, when a cow was found suffering from mastitis. The dairyman admitted that the milk from his cow had been mixed with that drawn from the remainder of the herd and sold. The same observer has also placed on record the case of five persons affected with acute catarrh of the stomach and bowels two hours after drinking milk obtained from the one dairy. These illnesses were also traced to a cow with inflammation of the udder; the abnormal secretion of this animal having been added to the yield of the other members of the herd, through the inadvertance of a servant. In Stockholm the members of nine families became ill, exhibiting fever, languor, faintness, nausea, vomiting and diarrhœa. All had obtained their milk supply from the same source. Inquiry at the farm from which the milk had been obtained elicited that a cow suffered from inflammation of the mammary gland, and that two of the employees in the dairy were incapacitated through a similar complaint to that of the customers. From the milk of the cow and from the fæces of the patients identical organisms were isolated, proving that the illness of the humans originated in the bovine, and was transmitted through the medium of the milk. The danger is all the greater because a chronic form of mastitis may be in existence for some time before the symptoms manifest themselves to such an extent as to direct the attention of the dairyman to it. The organisms causing this type of inflammation are similar to those known to be pathogenic to man.

A frequent source of milk contamination arises from the presence of an abscess located in some part of the udder. These abscesses may discharge externally, and in such cases during milking operations the pus is evacuated and invariably falls into the milk-pail. No doubt this gives "body" to the yield, but its presence, if known, would be as nauseous as it certainly is detrimental to the consumer.

Several decades ago the people of this country were startled by the announcement that scarlet fever was communicable from the cow to man. During an epidemic of scarlet fever it was discovered that the cows of one of the herds supplying the dairy suspected of having spread the infection were affected with an eruptive disease of the teats. The medical inspector who made the assertion believed that this disease of the cow was capable of causing scarlet fever in man, and that veterinary surgeons had failed to recognize the important rôle which it played in the dissemination of this epidemic disease. It was soon demonstrated, however, that a grave error of diagnosis had been committed, because the so-called cow scarlatina was in reality cowpox. Since then, this disease in cows has not received the attention which its importance demands. Everyone knows that a vaccine is prepared from calves artificially inoculated with this disease for the protection of humans against the ravages of smallpox. It is well known, too, that the milkers are frequently infected, but few instances are on record of its transmission through the agency of milk. This is probably due to the

fact that children are rendered immune through vaccination. Stern, however, has published an instance where a large number of children, after they had drunk of the milk of a herd affected with cowpox, suffered from an eruption of the lips which was typical of vaccina.

Within recent years it has been found that the udder of a cow may be the seat of actinomycosis, and it is possible that this disease may be transmitted by milk from cow to man.

Dirt.—The sediment which is occasionally seen at the bottom of a glass of milk after it has been allowed to settle for some time, is a clear indication of a lack of cleanliness either in its production or distribution.

On microscopical examination it is seen to be composed of fragments of vegetable fibres, some of which show evidence of having been partly digested, squamous epithelial cells derived from the skin, hairs, leucocytes, &c., and in some instances blood.

In milk sold in Glasgow, I found in three samples 10·50, 12·26, and 24·77 gr. of dried material per gallon respectively, and the Corporation Chemist some years later found the sediment thrown out by electrically driven separator to average 8·8 gr. of dried material per gallon. Numerous investigations have been undertaken to determine the amount of sediment in milk sold in large towns. In Hamburg it was found to vary from nil to 12·8 gr. of dried material per gallon, the average being 0·9. In Christiania the average per gallon was found to be 0·7 gr.; in Helsingfors, 0·12; in Berlin, 0·7; in Halle, 1·04; in Leipzig, 0·26; and in Munich, 0·6.

Backhaus estimates that 300 lb. of dirt is consumed daily by the inhabitants of Berlin in their milk. It was estimated by the late Mr. Brand, that in 1898, when the population of Glasgow was 724,349, the daily consumption of milk was some 75,000 gallons. Assuming that this estimate is correct, it follows that 104,576 gallons are required per diem to supply the 1,010,000 citizens in Greater Glasgow. If the average filth contamination be taken as 8·8 grains per gallon, then our milk supply each day contains an aggregate of 1,917 oz. of water free dirt.

Undoubtedly the major portion of the dirt in milk is the result of pollution in the byre. The Corporation, in pursuance of their powers under the Dairies, Cowsheds, and Milkshops Order, have issued the following regulation:—

"No purveyor of milk, or person selling milk by retail, shall permit any cow in his possession, or any part thereof, to remain in a filthy condition so as to expose the milk to infection or contamination," but, unfortunately, its application is confined only to those cows housed in byres located in the city. Every cow kept for the supply of milk for human food ought to be groomed at least once a day. By grooming, dirt, loose epidermis, &c., are removed, and the skin stimulated and toned, and the oily secretion of the numerous sebaceous glands, which serves as a protection against cold and wet, is increased. Its importance is appreciated by a few of our dairy farmers, and is included in the usual daily routine; by others it is either entirely neglected or perfunctorily performed in a spasmodic manner, so that it is not an uncommon sight to see the

poor brutes smeared with their own excrement and all manner of filth. Under these conditions it is not surprising to find our milk supply grossly contaminated with filth. This, however, is but one source of contamination. It is invariably the case that when cows are dirty the byre and the attendants are in the same condition. The majority of the latter have apparently no idea or at least intimate knowledge of personal cleanliness. It will doubtless be urged that the work does not conduce to cleanliness, but such a contention is untenable, because in some cases the farmer has succeeded in obtaining strict attention to this all important matter.

The udder and teats of every cow ought to be thoroughly cleaned before milking operations are commenced. This is not difficult when the cow is groomed daily and a clean bed provided. In all well-conducted dairies clean overalls, and water, soap, and towels are supplied, and the milkers are instructed to wash the udder and teats of any cow which have become soiled, and also to wash their hands before commencing to milk. In the majority of farms, however, no such precautions are taken. The milker, with unwashed face and hands, unkempt hair, and dirty clothing, commences operations by rubbing the udder with the hand so as to dislodge the grosser particles of adhering filth.

Many consider it necessary to keep the hands moist when milking. The necessary degree of moisture is obtained by allowing the milk to flow over the palms of the hands, the surplus being permitted to fall into the pail. The result of this moisture is soon apparent, as it and the continued friction cause the dirt adhering to the teats and hands to soften and drop into the milk. After the milk is drawn from the cow it is invariably passed through a close sieve which retains the greater particles. The portions which remain in the milk become softened, disintegrated, and disseminated.

The milk is, as a rule, consigned to the city in the antiquated wooden butt. The only reason for its survival is that it is almost indestructible. Many arguments, on the contrary, can be put forward for its disuse, but for the present it will suffice to refer to the impossibility of cleaning them, owing to their construction and their porous nature. These butts are closed with cork bungs, and in order to make them fit tightly one or more layers of cloth are interposed. These cloths are used day after day, and owing to their very imperfect purification they soon become dirty in the extreme. As a rule they are easily replaced, as a portion of any discarded cotton article is considered good enough.

The vessels used for the transit of milk from the producer to the distributor are unfastened, and thus ample opportunity is afforded to anyone desirous of tampering with the contents. Instances have been recorded where after the "admiral" had been broached the subtraction has been made good by the addition of dirty water.

The same marked indifference to adopting methods which would minimize the contamination and infection of our milk supply is shown by the majority of the purveyors. The average town dairyman is content to follow blindly the customs of a past generation. The almost universal method of distribution which obtains is proof of this assertion. For instance, the milk sold in shops is invariably

exposed in open vessels, consequently it is liable to be contaminated by the dust of the premises and also from the street. Again, those milk vendors who distribute milk from the cart decant it on the street, where it is exposed to filth and dust. Mention must also be made of the small distributing cans, which are used time and again without any attempt at purification until after the whole delivery has been effected. The dilapidated condition of many of these cans render it impossible to clean them in a thorough manner, and in the crevices a quantity of foul material is not infrequently present.

Inspection of Milch Cows (City).—The cowsheds in the city were visited on 857 occasions, and the milch cows housed therein were examined, with the result that 185 were found affected. These were dealt with as follows :—

51 systemic	Milk destroyed
2 mastitis, acute	,,
81 ,, chronic	,,
51 prominent lymph. glands	——
185	

Inspection of Milch Cows (Country).—Farms situated outside the city were visited on 499 occasions, and 14,777 milch cows were examined. 374 were found affected, and dealt with as follows :—

35 systemic	Milk destroyed
191 mastitis, chronic	,,
98 prominent lymph. glands	——
374	

For comparison, I submit the following table to show the work done by this Department during the last four years. It is of interest in showing the striking progressive improvement which has taken place :—

1909			1910			1911			1912		
Total number	Number positive	Per cent. positive	Total number	Number positive	Per cent. positive	Total number	Number positive	Per cent. positive	Total number	Number positive	Per cent. positive
Milk from country cows with disease of udder.											
467	24	5·1	506	6	1·18	584	11	1·88	484	0	0
Milk from town cows with disease of udder.											
125	4	3·3	169	8	1·18	151	1	0·66	184	0	0

Fever Hospitals' Milk Supply.—The three farms supplying the fever hospitals with milk were visited on ninety-four occasions. By the terms of contract the farmers undertake "that no milch cow shall be added to, or retained in, the herd if . . . . it reacts to the tuberculin test."

The following table shows the number of cows tested with tuberculin, and the number passed or rejected :—

	Result of test			
Number tested	Negative	Positive	Doubtful	Rejected
195 ...	122 ...	68 ...	5 ...	73

In addition to being tested with tuberculin, the cows in these herds are clinically inspected at frequent intervals. On these occasions thirty-eight samples of milk were drawn from cows showing abnormal changes in the udder, and four swabs were taken from cows with a muco-purulent discharge from the lungs. These samples and swabs were submitted to the Bacteriologist, who, after inoculation experiments, reported that they were not infected by tubercle bacilli. The farmers, too, are under contract to immediately notify all cases of illness occurring among their cows, and to isolate all those affected.

VICTORIA VETERINARY BENEVOLENT FUND.

THE annual general meeting of the Victoria Veterinary Benevolent Fund was held at 10, Red Lion Square, London, on Wednesday, June 4, 1913. Present were: W. Freeman Barrett (President), Sir John McFadyean, Messrs. G. Thatcher, N. Almond, G. Banham, F. Gooch, H. MacCormack, J. H. Carter, F. Garnett, A. E. Mettam, F. Hobday, W. Mulvey, F. Bullock, and Wm. Shipley (Secretary).

The minutes of the previous annual general meeting were taken as read.

On the proposition of Mr. MacCormack, seconded by Mr. J. Carter, the annual report was received.

Report and accounts for the nine months ended December 31, 1912, to be submitted to the fifteenth annual meeting of the members to be held at 10, Red Lion Square, London, by permission of the Council of the Royal College of Veterinary Surgeons, on Wednesday, June 4, 1913, immediately after the annual meeting of the Royal College of Veterinary Surgeons, which takes place at 12 o'clock noon.

The Council begs to present its report for the nine months ending December 31, 1912:—

It will be remembered that at the last annual meeting the rules were altered to make the financial year end on December 31 instead of March, so as to coincide with the period for which the subscriptions were payable. The present account, therefore, only includes subscriptions received from new members and arrears, totalling £64 18s. 6d.

The membership of the Society at December 31, 1912, numbered 305, an increase of over 100 for the period.

The relief granted as shown by the following table (not reproduced) amounts to £177 15s. 4d., which is an increase of £24 7s. 4d. over the previous year.

Increased grants have been made in some cases, and there are still many deserving cases which it is impossible to relieve owing to lack of income.

The members are earnestly appealed to to use every means in their power to obtain new subscribers, as it is only by this means that the objects of the Society can be obtained.

A list of the present subscribers is annexed hereto (not reproduced).

VICTORIA VETERINARY BENEVOLENT FUND.

INCOME AND EXPENDITURE ACCOUNT FOR THE NINE MONTHS ENDED DECEMBER 31, 1912.

DR. CR.

INCOME.	£	s.	d.
To Relief granted	177	15	4
,, London Orphan Asylum grant	2	2	0
,, Printing, postages, advertising, and incidental expenses	25	5	9
	£205	3	1

EXPENDITURE.	£	s.	d.
By Subscriptions	64	18	6
,, Interest and Dividends	67	0	4
,, Income Tax returned	3	11	8
,, Excess of Expenditure over Income	69	12	7
	£205	3	1

BALANCE SHEET, DECEMBER 31, 1912.

	£	s.	d.	£	s.	d.
To Capital account, March 31, 1912	3,384	4	8			
Add—Donations	64	12	6			
Life Member	10	10	0			
				3,459	7	2
,, Income and Expenditure Account, March 31, 1912	103	15	9			
Deduct—Excess of Expenditure to December 31, 1912	69	12	7			
				34	3	2
Four Subscriptions paid in advance				3	12	6
				£3,497	2	10

	£	s.	d.	£	s.	d.
By Investments at cost:—						
£3,433 12s. 3d. 2½ per cent. Consolidated stock	2,945	14	7			
£550 3 per cent. Norwich Corporation Redeemable Stock	532	3	6			
				3,477	18	1
,, Cash at Bankers				19	4	9
				£3,497	2	10

We have examined the above accounts with the books and vouchers and certify the same to be correct. We have ascertained that the securities are registered in the names of the Trustees. The Bankers have certified the correctness of the balance on current account.

March 25, 1913.

JOSEPH WOODGER,
ALBERT E. LARK, } *Hon. Auditors.*

Mr. Freeman Barrett has been re-elected President by the Council.

The following members of the Council retire by rotation: Messrs. W. S. Mulvey, Professor Penberthy, Professor Shave, C. Sheather, Wm. Shipley, P. J. Simpson, and S. H. Slocock; and they have been nominated for re-election. Mr. A. E. West has also been nominated to fill a vacancy.

The Council report the election of Sir Stewart Stockman, Messrs. W. Shipley and F. W. Garnett as Trustees.

The Auditors are Messrs. Joseph Woodger, M.R.C.V.S., and Albert E. Lark, F.C.A., who are recommended for re-election.

The accounts for the nine months ended December 31, 1912, duly audited, are annexed to this report.

The Council desire to point out that it is impossible to give a reasonable statement of accounts as it has only nine months of a financial year to deal with, and the whole of the income was made up from interest and new subscribers, hence the unfortunate deficit of £69. A more explicit statement can be made in future years when the accounts will be made up to December 31, instead of March 31, as previously done.

As was recommended at the last annual general meeting held at Dublin, the following five members, Messrs. J. A. Thompson, O. J. Howard, J. F. Healy, P. D. Reavy, and Professor O'Connor, have been appointed a Committee for Ireland, to consider and recommend to the Council cases of distress. Professor O'Connor has consented to act as local Secretary, and the Council feels it will obtain great help from this Committee in the consideration of cases and in forwarding the work of the Fund in Ireland.

The Council fully recognize that there is a great work to do, and that the members of the profession cannot be aware of the distress that occurs amongst old members, and also amongst the widows and children of veterinary surgeons who have died before they have been able to make proper provision for their dependents. It must be apparent that no grant less than 10s. per week can meet the pressing needs of a widow, even if without little children. It is to be hoped in future no grant should be less than that sum. This would entail at present an expenditure on grants alone of £360 per annum, a sum quite impossible with our present income.

A subscription of 10s. 6d. a year (little enough) entitles to membership.

The Council feel that, if every member of the Fund would endeavour to influence at least one other member of the profession, and point out the good work that is being done, our list should be doubled. *You are therefore requested to post this on to one with an explanatory letter.*

The Secretary will be pleased to give any further information.

By Order of the Council,

W. Freeman Barrett,

President.

After discussion it was adopted on the proposition of Mr. J. H. Carter, seconded by Mr. Banham.

The following members of the Council were re-elected, namely: W. S. Mulvey, Professor Penberthy, Professor Shave, C. Sheather, W. Shipley, P. J. Simpson, and S. H. Slocock, with the addition of Mr. A. E. West, of Gray's Inn Road, London, to fill a vacancy.

The Auditors, Messrs. Woodger and Lark, were re-elected with a hearty vote of thanks for their services, on the proposition of Mr. MacCormack, seconded by Mr. J. H. Carter.

An urgent appeal was made by the President that the members of the profession should give more serious consideration of the claims of the Fund on their charity, in order that the good work which is being done may be more aptly carried out.

The proposition by the Chairman, seconded by Mr. J. H. Carter, of a vote of thanks to the Secretary for the preparation of the report was duly carried.

The Secretary would like to take this opportunity to acknowledge the support which he has received from his friends in the profession, and he only hopes that the slow and steady progress the Fund is making will be continued.

If he were able to indicate to each individual subscriber the pathetic appeals and sympathetic acknowledgments of the little help we are able to give, he feels assured that there is no member of the profession who is able who would refuse to help. He is also anxious to forward to anyone the rules and objects of the Association, and to give any information which may be desired.

WM. SHIPLEY,

Hon. Secretary and Treasurer.

Reviews.

Lehrbuch der Pharmakologie für Tierärzte (Text-book of Pharmacology for Veterinary Surgeons). By Georg Müller, Dr. med. vet. h.c. et phil., Professor of Pharmacology at the Dresden Veterinary College. 2nd edition, 72 illustrations in text, pp. 483. Paper backs, 13 marks; bound, 14·50 marks. Publishers, M. and H. Schafer, Hanover.

This is a very useful book, and among other innovations of an unusual but praiseworthy kind contains the hypodermic doses of various drugs for horses, cattle, sheep, pigs and dogs, as well as plain illustrations of seventy-two drugs and plants used in therapeutics and materia medica. It is quite up to date, and we find included in the text accounts of such medicaments as protargol, argyrol, the suprarenal preparations and their uses, as well as of sera, and bacterial preparations.

The metric system is, of course, used in giving the dosage for

various animals, and in the case of dogs, at any rate, it has its advantages over our system.

The book has been written specially for German and Austrian veterinary surgeons, and the pharmacopœia of both countries has been consulted in its compilation. The pharmacological substances are divided into twenty-one groups, and each group is discussed in a chapter. In order not to make the work cumbrous and to facilitate quick consultation on any subject all literary references are excluded from it. Where the price of a drug is very high attention is called to the fact in the text.

Altogether we think this work is an excellent one, well fulfilling the object for which it was intended, very serviceable as a book of reference, and reflecting great credit on the author and publishers.

G. M.

Studies in the Virus of Hog Cholera. By Walter E. King, F. W. Baeslack, and George L. Hoffmann. Published in Chicago. Name not given.

In examination of the blood of forty hogs (suffering from hog cholera) by the dark field illuminator the authors have constantly found characteristic spirochetes and granules. The spirochetes were discovered with less difficulty in the blood of hogs suffering from the acute than chronic form of the disease. In a little brochure reprinted from the *Journal of Infectious Diseases*, and published in Chicago, the experiments and findings of the research workers are given. They state that "without cultures to inoculate susceptible animals it is, of course, impossible at this time to definitely ascribe to the spirochete under observation any pathogenic properties or ætiological significance. . . . . In some particulars the results strongly suggest the relationship of the spirochete (which has been named by the discoverers *Spirochæta suis*) to hog cholera as a causative factor."

Evidently the dark ground illuminator has been of much use to these investigators, and maybe more light is soon to be thrown on the organism responsible for swine fever.

G. M.

Die Bekampfung der Tuberkulose des Rindes mit besonderer Berücksichtigung der Klinischen et Bakteriologischen Feststellung (The attacking of Tuberculosis in Cattle with special reference to its clinical and bacteriological diagnosis). By Robert von Ostertag, Dr. med. et Dr. med. vet. h.c. Pp. xii + 591, with 88 illustrations. Price, paper, 16 marks; bound, 17 marks 50 pfennigs. Publisher, Richard Schoetz, Wilhelmstrasse 10, Berlin.

At a time when measures against tuberculosis occupy so much prominence in this country, the publication of an exhaustive work on the subject of tuberculosis in cattle from the pen of that great authority Dr. Robert Ostertag is both noteworthy and opportune. Here we appear to be commencing to touch the borderland of

the matter, but in Germany they have travelled a long way. The clinical methods adopted to diagnose open tuberculosis as described in this book are thorough and comprehensive, and include harpooning the udder, collecting mucus from the trachea and bronchi by means of tracheotomy and the taking of swabs through a canula, also obtaining of mucus by means of a throat spoon, and of vaginal secretion by a vaginal spoon. Lung, udder, uterine, and intestinal tuberculosis are thoroughly discussed and dealt with under the heading of "open tuberculosis." The bacteriological diagnosis of this condition and regulations against the disease have chapters to themselves, and the book concludes with a lengthy bibliography of the works consulted. The volume is dedicated to Dr. Bernhard Bang.

No more valuable book on bovine tuberculosis has yet appeared, every phase of the subject is covered, and all technical detail made plain. The question of open tuberculosis and its diagnosis is dealt with by a master hand. The illustrations in the book number 88, and are all interesting and instructive. No veterinary surgeon who can read German should be without the book, and those who cannot should hope for an English translation of it.

G. M.

ROYAL COLLEGE OF VETERINARY SURGEONS.

Election to Council.

At the annual meeting of the Royal College of Veterinary Surgeons, held on June 4, the following result of election to Council was announced: Shipley, 887; Mulvey, 847; McKinna, 841; Carter, 840; Price, 795; Slocock, 771; Shave, 766, McCall, 719; Packman, 610; Crowhurst, 555; Gofton, 508. The first nine gentlemen were declared elected. As the result of a ballot, Mr. W. Shipley was elected to fill the vacancy caused by the death of Mr. R. Roberts, and he will accordingly retire in 1914.

ERRATA.

Page 208, line 4 from end, for "*Bacillus bigeminum*" *read* "Babesia."

Page 209, line 24 from end, "a recovery from infection . . . immunity." The last inverted commas are omitted.

Correspondence.

To the Editor of THE VETERINARY JOURNAL.

DEAR SIR,—On looking over a copy of the June issue of THE VETERINARY JOURNAL we observed a reference to one of our products by Mr. J. Chalmers in his report on an interesting case of Cerebral Paralysis, pp. 289-91.

The reference to which we refer occurs at the foot of p. 290, and in quoting the formula of "Tabloid" Blaud Pill Compound No. 1 an unfortunate printer's error has occurred, the quantities of aloin, strychnine, and arsenious acid having been given somewhat ambiguously as "āā gr. ½ dr." To make the matter quite clear we quote the correct formula:—

℞ Pil. ferrugin. (Blaud)	gr. 10
Pulv. capsici	gr. 1/4
Aloini	gr. 1/30
Strychninæ	gr. 1/30
Acidi arseniosi	gr. 1/30

Yours very respectfully,
BURROUGHS WELLCOME AND CO., per S. F. M.

Letters and Communications, &c.

Mr. Payne; Professor Liautard; Dr. A. Hughes; Mr. C. J. Dixson; Mr. W. M. Scott; Mr. G. Mayall; Capt. Deacon; Mr. A. E. Willett; Mr. T. B. Goodall; Mr. J. F. D. Tutt; Capt. Pallin; Mr. Mitter; Professor Sisson; Professor Craig; Dr. Burton Rogers; Professor Law; Mr. Bevan; Mr. Haskell.

Books and Periodicals, &c., Received.

The American Veterinary Review; Journal of the Royal Army Medical Corps; Recueil de Médecine Vétérinaire; L'Hygiène de la Viande et du Lait; Revue Générale de Médecine Vétérinaire; Der Tierarzt; Zeitschrift für Veterinärkunde; Berliner tierärztliche Wochenschrift; Osterreichische Wochenschrift für Tierheilkunde; La Clinica Veterinaria; Revista de Medicina Veterinaria; Board of Agriculture and Fisheries; Department of Agriculture and Technical Instruction for Ireland; Kennel Gazette; Agricultural Journals for the Union of South Africa and for Rhodesia; American Journal of Veterinary Medicine.

NOTE.—All communications should be addressed to 8, Henrietta Street, Covent Garden, London, W.C. Telephone, 4646 Gerrard. Telegrams, "Baillière, London."

Letters for the JOURNAL, literary contributions, reports, notices, books for review, exchanges, new instruments or materials, and all matter for publication (except advertisements) should be addressed to the Editors.

Manuscript—preferably type-written—should be on one side only of paper, marked with full name of author.

Illustrations for reproduction should be in good black or dark brown on white paper or card.

Advertisements and all business matters relating to the JOURNAL should be addressed to the publishers, Messrs. Baillière, Tindall and Cox.